4. CVISN PHASE PLANNING

Amid a wash of paper,
a small number of documents become critical pivots
around which every project's management revolves.

The above from Rechtin [10] quoting Frederick P. Brooks's classic *The Mythical Man-Month*.

A systematic planning process is essential to reveal and formalize the work to be done, and then to communicate the results among team members and other stakeholders.

At this point in the project management lifecycle you have moved from the up-front planning stage to the implementing stage. Detailed task planning and tracking are mutually coupled and interdependent. In this chapter we'll focus on phase planning, a "lean and mean" effort to produce a concise **Phase Plan**.

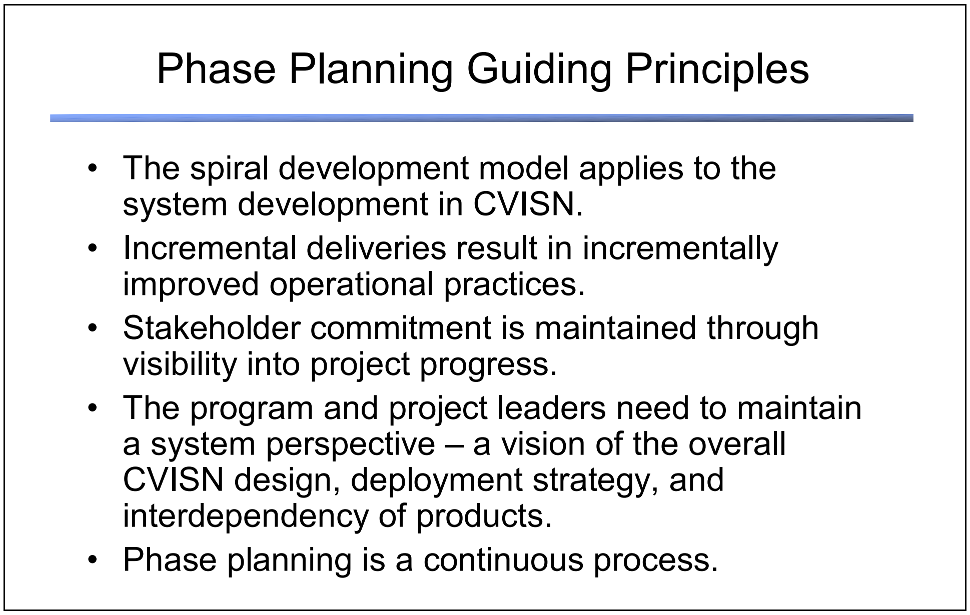
As discussed in Chapter 2, CVISN implementation follows the spiral development model via successive phases of incremental delivery. In this chapter we first discuss some **guiding principles** on which our recommended CVISN phase planning process is based. Next we discuss **operational concepts** that are generalized from particular instances or experience and can be applied to new situations. Lastly, we lay out phase planning **process steps** which you should tailor to your unique project environment, organizational culture, and available tools.

4.1 Phase Planning Guiding Principles

Figure 4–1 lists the principles for phase planning in CVISN.

1. **The spiral development model applies to the system development in CVISN**. This is a re-statement of Chapter 2. As explained there, the essence of the spiral model is to first establish a baseline plan and an overall vision of the design, and then to deploy the products incrementally by successive iterations through design, build, test, and next-phase planning.

2. **Incremental deliveries result in incrementally improved operational practices.** Planning, developing, and releasing products incrementally – such that useful end-to-end functionality is delivered with each system build or product release – enables end-users to do their jobs better with each iteration. This principle suggests that we should aim for increasing end-to-end functionality as opposed to increasing stand-alone functionality whenever possible. For example, one IRP transaction type that goes all the way through the back-end record keeping system is preferable to a user screen that shows all the transaction types but doesn't complete any processing. The former completely exercises the system; even though it is narrow in scope it is deep in penetration.



Phase Planning Guiding Principles

- The spiral development model applies to the system development in CVISN.
- Incremental deliveries result in incrementally improved operational practices.
- Stakeholder commitment is maintained through visibility into project progress.
- The program and project leaders need to maintain a system perspective – a vision of the overall CVISN design, deployment strategy, and interdependency of products.
- Phase planning is a continuous process.

Figure 4-1. Phase Planning Principles

3. **Stakeholder commitment is maintained through visibility into project progress.** Seeing is believing (and believing is funding). Nothing succeeds like success. There are good reasons these aphorisms are well-worn – you must keep nurturing the confidence of your stakeholders as shown in Figure 4–2. Providing visibility means offering physical demonstrations of useful capability, and regular management status reporting.

Some means to accomplish this are:

- Seizing opportunities for showing off functional capability, such as a live software demo on a portable computer, or a site tour of an operational electronic screening capability at a weigh station.
- Establishing an Initial Operating Capability as early as possible so as to deliver real benefits.
- Outreach activities such as an "Industry Day" at a weigh station or truck stop.
- Regular stakeholder status reporting in the form of progress charts. Samples are included in this Guide.
- Engaging stakeholders in operational tests and assessment of results.

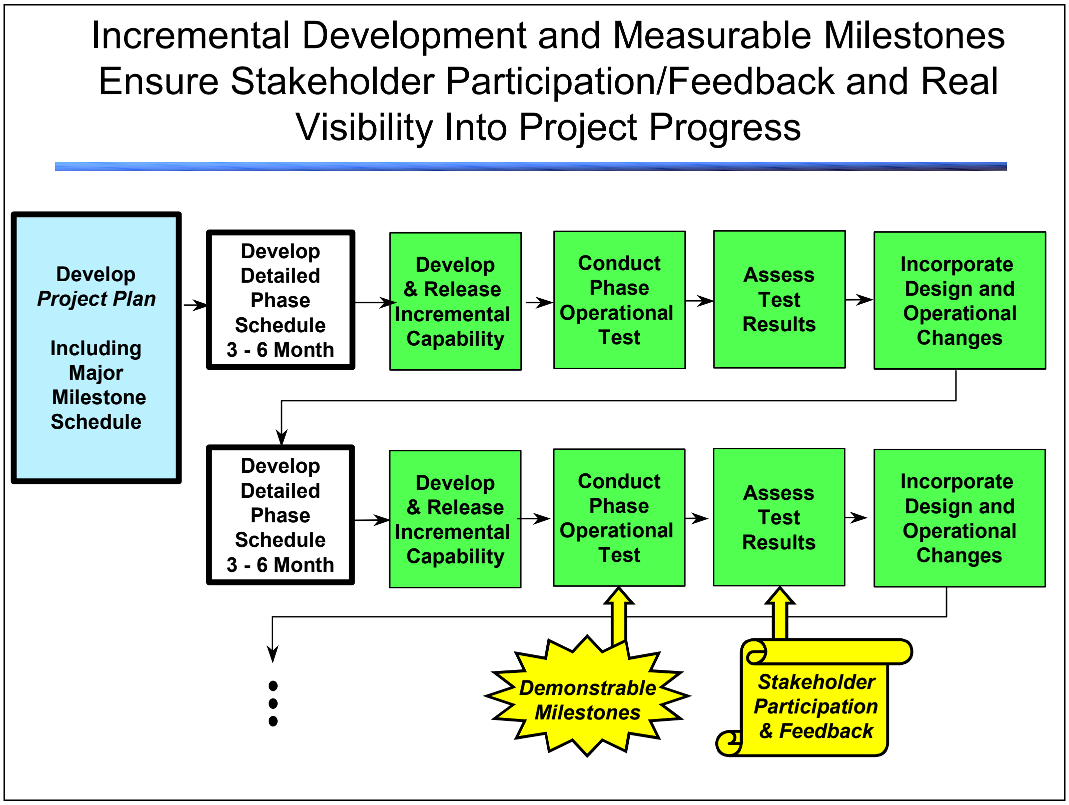

Incremental Development and Measurable Milestones Ensure Stakeholder Participation/Feedback and Real Visibility Into Project Progress
Develop Project Plan Including Major Milestone Schedule
Develop Detailed Phase Schedule 3 - 6 Month
Develop & Release Incremental Capability
Conduct Phase Operational Test
Assess Test Results
Incorporate Design and Operational Changes
Develop Detailed Phase Schedule 3 - 6 Month
Develop & Release Incremental Capability
Conduct Phase Operational Test
Assess Test Results
Incorporate Design and Operational Changes
Demonstrable Milestones
Stakeholder Participation & Feedback

Figure 4-2. Give Stakeholders Insight into Progress

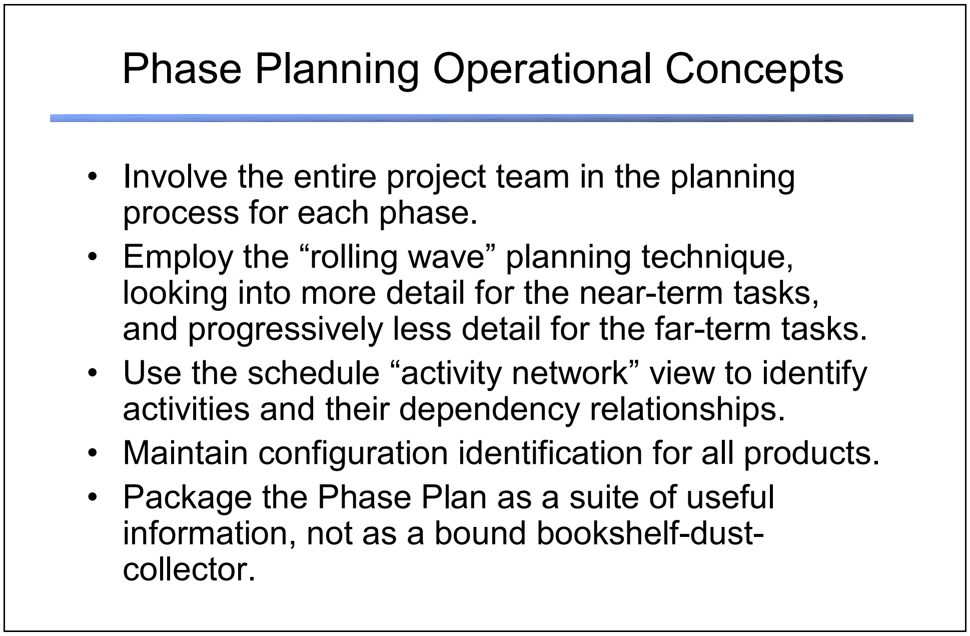
4. **The program and project leaders need to maintain a system perspective – a vision of the overall CVISN design, deployment strategy, and interdependency of products and projects.** It is very easy for the development teams "working in the trenches" to be so focused on short-term goals that they lose sight of overall efficiencies. This is a job of the System Architect, which is why that is such a key team role. This "overall vision" is more than a mere statement of objectives. It is the envisioned technical systems as captured and expressed by top-level logical design drawings, subsystem identification, interface specifications, and program-level milestones. As an example of maintaining a system perspective and adjusting it when required, over just a few years the robustness of server-hosted browser-based user interfaces with centralized database back-ends has overtaken the reasonableness of deploying stand-alone desktop computer single-user applications. On the other hand, the supposedly common sense move to the "universal" Java programming language has sometimes failed in practice, and those developers have been forced to re-tool for a better-supported but more primitive programming language environment.

5. **Phase planning is a continuous process.** Just like a marching army the project team needs to be fed. This means that costs will continually accrue – and sometimes it's easy for months to go by before you realize nothing has been accomplished. It's not plan and forget. Keep an eye on the schedule and a constant awareness of what barriers need to be removed in order to sustain progress.

4.2 Phase Planning Operational Concepts

Figure 4–3 lists the operational concepts for phase planning in CVISN.

1. **Involve the entire project team in the planning process for each phase.** You might want to schedule a phase planning mini-workshop with your team to kick off the planning for each phase. Appendix E contains some suggestions for conducting a phase planning session.



Phase Planning Operational Concepts

- Involve the entire project team in the planning process for each phase.
- Employ the “rolling wave” planning technique, looking into more detail for the near-term tasks, and progressively less detail for the far-term tasks.
- Use the schedule “activity network” view to identify activities and their dependency relationships.
- Maintain configuration identification for all products.
- Package the Phase Plan as a suite of useful information, not as a bound bookshelf-dust-collector.

Figure 4-3. Phase Planning Operational Concepts

2. **Employ the “rolling wave” planning technique, looking into more detail for near-term tasks, and progressively less detail for far-term tasks.** For example elements at level 3 of the WBS that are currently being developed should be decomposed to level 4 or 5, whereas other elements that are being deferred until later can remain at level 3. In the detailed activity network schedule, those activities occurring in the next month or two should be broken down to an average of one person-month each, whereas activities occurring over the phase planning horizon can represent more work, say an average of six person-months each. This is portrayed graphically in Figure 4–4. You will hear the project management profession [12] call near-term activities “work packages” and far-term activities “planning packages”.

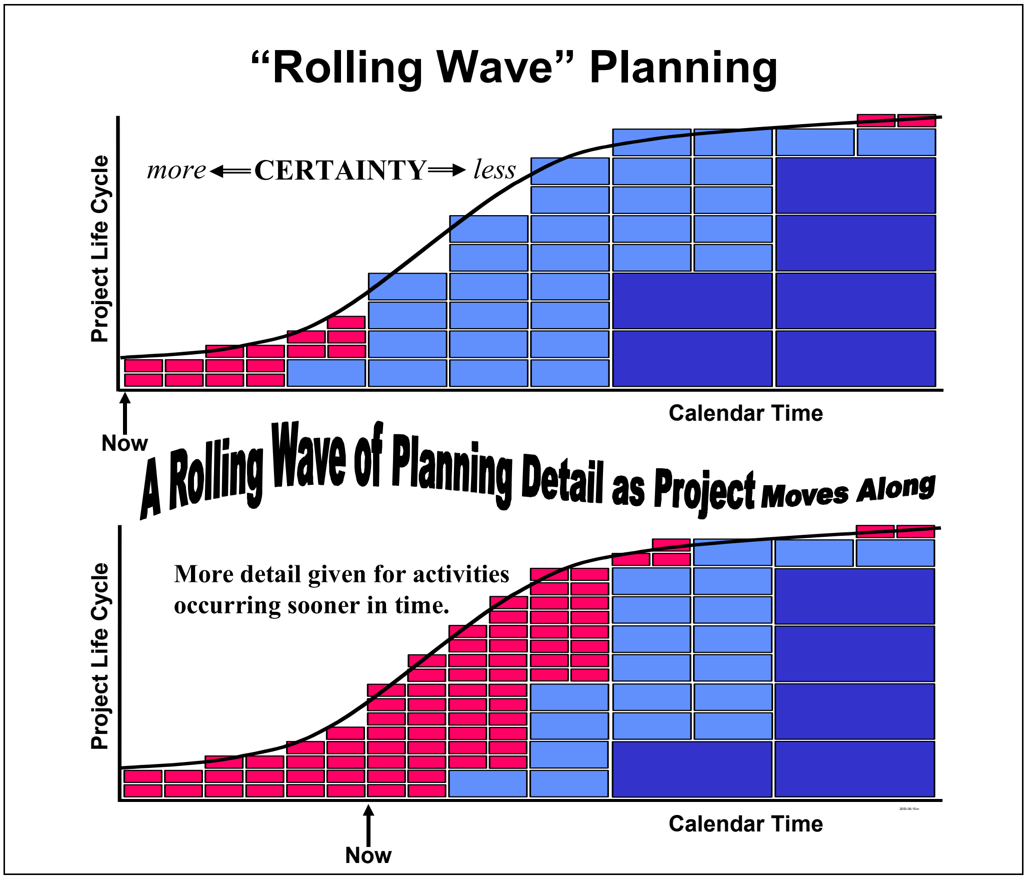

“Rolling Wave” Planning
more ⟸ CERTAINTY ⟹ less
Project Life Cycle
Calendar Time
Now
A Rolling Wave of Planning Detail as Project Moves Along
More detail given for activities occurring sooner in time.
Project Life Cycle
Calendar Time
Now

Figure 4-4. The Rolling Wave Planning Technique Decomposes Work in the Near-Term into More Detail

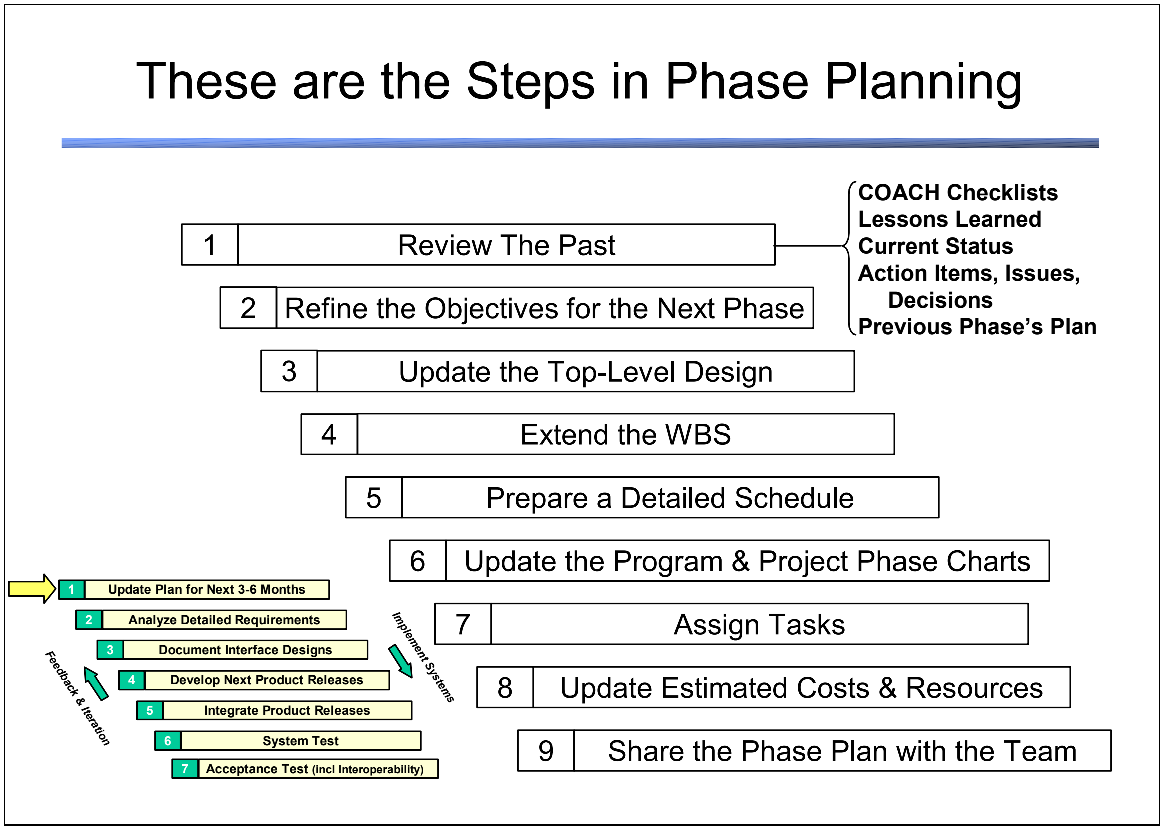
3. **Use the schedule “activity network” view to identify all activities and their dependency relationships.** The activity network (see Section 3.5) is a standard capability of every desktop scheduling software package. If you have been persistently attached to Gantt charts, please give the network view a try – only the network view can adequately portray the interdependence of activities. Today’s desktop scheduling software tools [14] generate both the network diagram and the Gantt chart from the same activity database. As a practical matter the network view is best printed on a large-format output device such as a 36-inch roll-fed color ink jet printer. Please review Chapter 3 for more on scheduling.

4. **Maintain configuration identification for all products.** As we discussed in Chapter 2, during an incremental development and deployment approach, you will be integrating interim versions of products to achieve intermediate capabilities. Chaos will quickly set in unless your development teams can unmistakably identify the installed base of software versions and their capabilities. Remember also to keep track of the underlying commercial-off-the-shelf (COTS) products (such as operating systems, databases, communications protocols, etc.) that go along with the applications you or your vendors deploy.

5. **Package the Phase Plan as a suite of useful information, not as a bound bookshelf-dust-collector.** Unlike the program plan, which can be allowed to age, the Phase Plan must remain current and very much "alive." Therefore, it should be thought of not as a permanently bound document, but rather as a stack of pages that one might organize in a three-ring notebook and carry around to meetings. See Appendix B for ideas about keeping a Project Manager's Notebook.

4.3 Phase Planning Process Steps

Next, we describe the recommended process for planning a phase in one of your CVISN projects. This process is illustrated in Figure 4–5. You'd go through this before each new phase, say every 3 to 6 months.



These are the Steps in Phase Planning

1 Review The Past

2 Refine the Objectives for the Next Phase

3 Update the Top-Level Design

4 Extend the WBS

5 Prepare a Detailed Schedule

6 Update the Program & Project Phase Charts

7 Assign Tasks

8 Update Estimated Costs & Resources

9 Share the Phase Plan with the Team

COACH Checklists
Lessons Learned
Current Status
Action Items, Issues,
Decisions
Previous Phase's Plan

1 Update Plan for Next 3-6 Months

2 Analyze Detailed Requirements

3 Document Interface Designs

4 Develop Next Product Releases

5 Integrate Product Releases

6 System Test

7 Acceptance Test (incl Interoperability)

Figure 4-5. Phase Planning Process

As a reminder, please refer to Figure 1-7 for an illustration of what should be in your Phase Plan – the product of the phase planning process. Flesh-out certain elements of your project plan, each in more detail than before (see Appendix B for examples):

- Phase Objectives.
- Work Breakdown Structure decomposed to lower levels, with responsibility assigned.
- Detailed working-level schedules with tasks small enough to be assigned to individual team members (see Chapter 3 about scheduling).
- Milestones.
- Budget.
- Status charts for the previous phase, for updating to the next phase.
- Anything else you find useful.

You will be called upon to present status at a variety of meetings, and to write status reports. Designing the planning materials to make them "presentable" will simplify your life. Build your Phase Plan with materials that are easy to update, and that are readily adaptable for a presentation or as the basis for a more formal progress report.

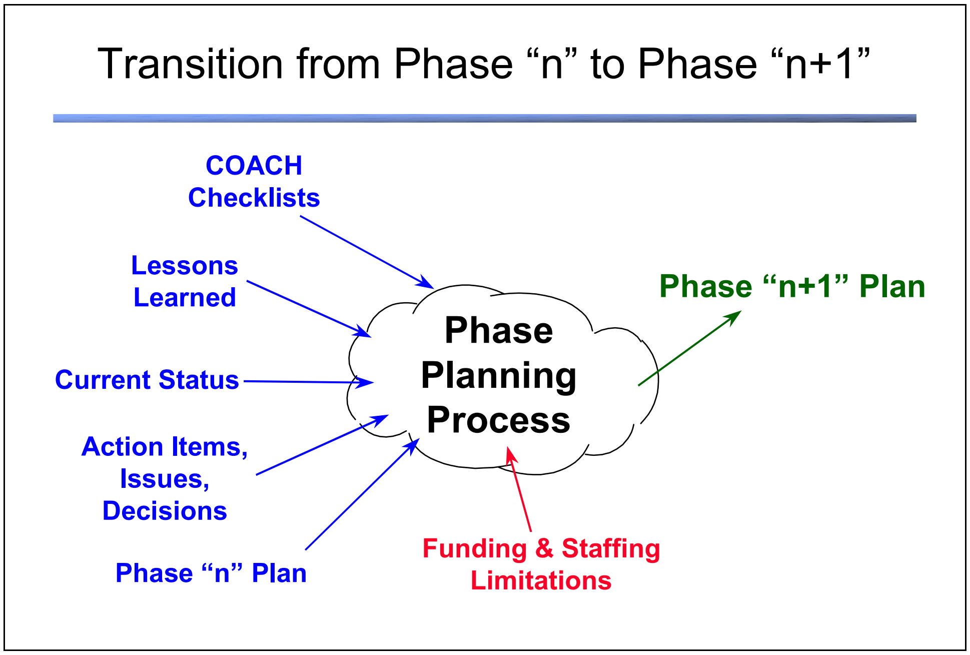
Do as many as possible of the steps below in project team joint working sessions. That will keep team spirit up, facilitate communication, and assist new team members in getting on board. Store and maintain the planning and status materials on-line (for example, in a server directory) accessible to all the team members.

4.3.1 Review the Past (Step 1)

The project team should refresh their memories about where the project is, how it got there, and the original intentions for the future (in particular, the upcoming phase). This is illustrated in Figure 4–6. Remind the team that applying lessons learned in the past can head off problems in the future.

Review COACH Checklists
A subset of the team should quickly review all parts of the COACH (CVISN Operational and Architecture Compatibility Handbook) [15] checklists previously completed by the state's CVISN Program team. During the review, focus on the sections closely related to the work you are now planning. This review is intended as a refresher for where you are headed, and as an opportunity to update what you've said previously. As necessary, update the COACH checklists. If you are changing anything that might affect another project, be sure to collaborate with the Program Manager and that Project's Leader.

Review Lessons Learned
Think and talk about what you did in the previous phases that worked well, and what you'd like to do differently. If a process isn't working, figure out how to fix it. Give everyone on the team a chance to share and contribute, using a round-robin approach. Appendix F tells how to conduct a formal Lessons Learned session.



Transition from Phase “n” to Phase “n+1”

COACH Checklists

Lessons Learned

Current Status

Action Items, Issues, Decisions

Phase “n” Plan

Phase Planning Process

Funding & Staffing Limitations

Phase “n+1” Plan

Figure 4-6. Review the Past as You Plan for Next Phase

<u>Review Current Status</u>
Summarize the status of key milestones on this and related projects. Review the status of external dependencies. Check planned versus actual funding and spending levels.

<u>Review Action Items, Issues, and Decisions</u>
This is a good time to go over the lists of program-wide and project-specific open action items and unresolved issues. Also revisit previously-made decisions. Are they still valid?

<u>Review Previous Phase’s Plan</u>
Are there incomplete tasks to be stretched out into the next phase? Has testing been completed? Are there any repairs that need to be factored into the upcoming phase? Are there any schedule or cost lessons learned that you recognize now as you look back?

Consider the staff you have available to work on the project, and the amount of funds unspent and expected. Update the plan to reflect new constraints, the sharing of staff with other projects, etc.

4.3.2 Refine the Objectives for the Next Phase (Step 2)

When you initially defined your project plan you established high-level objectives for each project phase. Revisit those original ideas, update, and refine them. Do any unmet objectives from the previous phase carry into this one? Conversely are there any objectives originally allocated to future phases that should be accelerated and moved into this phase?

Identify which elements of the top-level design baseline are to be deployed in this phase. Then, as a team, flesh out the detailed requirements that will drive the WBS extension in Step 4. Keep the spiral model in mind!

4.3.3 Update the Top-Level Design (Step 3)

Because this is an iterative process, what your team learns during detailed development may force changes in the top-level design approach. Review and revise the top-level design as needed. Revisit the operational scenarios and functional thread diagrams; the interface specifications; the allocation of functions to systems; and the physical design. Update the design as needed.

4.3.4 Extend the WBS (Step 4)

Decompose the applicable lower-level details of the work breakdown structure. Recall from the *CVISN Guide to Program and Project Planning* [4] that a WBS is a "product-oriented hierarchy of goods and services". First, decompose products into a hierarchy of their elements; then identify the major tasks to produce them. Products to be completed in this phase should be fully-decomposed, along with integration and testing tasks, plus associated documentation, training, and field support. Minor tasks can be captured as to-do items. Don't forget to review the procurement tasks because there may be some long-lead items. WBS development is a worthwhile activity to do as a team in order to establish a common understanding, and to avoid duplication or omission within the WBS.

4.3.5 Prepare a Detailed Schedule (Step 5)

Develop a detailed schedule for the work to be accomplished during the phase. Be sure to include adequate time for technical reviews, repairs after testing, and procurement cycles.

The scheduling process is most effectively done by identifying and then linking activities per the critical path method (Section 3.5), taking advantage of a desktop scheduling software package. The output can be printed both as a Gantt (bar) chart, and as an activity network chart.

Don't forget project external dependencies, with their associated delivery or need-by dates.

4.3.6 Update the Program & Project Phase Charts (Step 6)

Recall that the *program* phase charts show what new capabilities will be provided by each *project* in a program phase. Each *project's* phase charts show what new capabilities will be provided by each *product* in a project phase. Therefore update both sets of charts once the detailed scheduling has been completed. If you had originally planned to compete an activity in this phase but you are now delaying it, check to see if other projects were depending on it, and negotiate with them.

4.3.7 Assign Tasks to Individual Team Members (Step 7)

Make sure that every task that is to be accomplished during this phase is assigned to a responsible organization and to an individual. You can record their names in the scheduling tool. Meet with those individuals to review the requirements (technical, schedule, cost constraints) and get their buy-in. Be sure their line supervisors are aware of and agree to the assignments.

4.3.8 Update Estimated Costs & Resources (Step 8)

Re-figure the estimate-to-completion for costs and resources. Ensure that you have the cash flow you need – you don't want to run out of money before receiving the next installment. Revisit the organizational staffing plan to make sure it lines up with the scheduled task assignments. Report any problems to the Program Manager, and be ready to re-work your plan.

4.3.9 Share the Phase Plan with the Team (Step 9)

Make a draft Phase Plan available quickly. Although there will still be work in some areas such as cost calculations, draft versions of everything should be available within two weeks of the team joint planning session.

Present the final Phase Plan to the project team members in a follow-up meeting of say 2 hours. This provides the forum for dissemination of details that weren't resolved in the draft planning stage. Equally important, this gives the participants a sense of "closure" by seeing tangible output from all the planning efforts.

After this follow-up session **do not worry about formally publishing it**. Let the elements of the Phase Plan remain a living set of documents to be used and revised during the phase.

Be sure to have periodic (typically monthly) review sessions to check on progress and the likely need for changes. Trust but verify – this is the subject of the next chapter.